

WHAT IS CLAIMED IS:

5

1. A packet fluctuation absorbing method comprising the steps of:

receiving packets from a preceding node of a network;

temporarily retaining the packets in a buffer;

10 reading the respective packets from the buffer, in the order of receiving of the packets, at given time instants;

outputting the read packets to a following node of the network so as to absorb time-related fluctuations of the packets;

15 storing a lower limit of the buffer that is predetermined as being larger than zero; and

discarding, when the number of retained packets in the buffer is less than the stored lower limit as a result of the outputting of one of the read packets and a use count of the corresponding one of the read packets is equal to or larger than a predetermined use  
20 count upper limit, the corresponding packet in the retained packets of the buffer.

25

2. The packet fluctuation absorbing method according to claim 1, further comprising the step of discarding, when the number of retained packets in the buffer is above the stored lower limit as a result of the inputting of one of the received packets and a use  
30 count of the corresponding one of the received packets is not equal to zero, the corresponding packet in the received packets in the buffer.

35

3. The packet fluctuation absorbing method according to

claim 1, further comprising the steps of:

storing an upper limit of the buffer that is predetermined as being smaller than a maximum level of the buffer; and

discarding, when the number of retained packets in the buffer exceeds the stored upper limit as a result of the outputting of one of the read packets, the corresponding packet in the retained packets of the buffer in accordance with a predetermined discard packet ratio.

10

4. The packet fluctuation absorbing method according to claim 3, further comprising the steps of:

storing an optimum value of the buffer that is predetermined as being between the lower limit and the upper limit; and

discarding, when the number of retained packets in the buffer is less than or equal to the stored optimum value as a result of the outputting of one of the read packets, the corresponding packet in the retained packets of the buffer.

20

5. A packet fluctuation absorbing apparatus comprising:  
a packet input unit receiving packets from a preceding node of a network;

a buffer temporarily retaining the received packets;

a packet output unit reading the respective packets from the buffer, in the order of receiving of the packets, at given time instants and outputting the read packets to a following node of the network so as to absorb time-related fluctuations of the packets;

a lower limit storing unit storing a lower limit of the buffer that is predetermined as being larger than zero; and

a first discarding unit discarding, when the number of retained packets in the buffer is less than the stored lower limit as a result of the outputting of one of the read packets and a use count

35

of the corresponding one of the read packets is equal to or larger than a predetermined use count upper limit, the corresponding packet in the retained packets of the buffer.

5

6. The packet fluctuation absorbing apparatus according to claim 5, further comprising a second discarding unit discarding, when the number of retained packets in the buffer is above the stored lower limit as a result of the inputting of one of the received packets and a use count of the corresponding one of the received packets is not equal to zero, the corresponding packet in the received packets in the buffer.

15

7. The packet fluctuation absorbing apparatus according to claim 6, further comprising:

20

an upper limit storing unit storing an upper limit of the buffer that is predetermined as being smaller than a maximum level of the buffer; and

a third discarding unit discarding, when the number of retained packets in the buffer exceeds the stored upper limit as a result of the outputting of one of the read packets, the corresponding packet in the retained packets of the buffer in accordance with a predetermined discard packet ratio.

25

30

8. The packet fluctuation absorbing apparatus according to claim 7, further comprising:

35

an optimum value storing unit storing an optimum value of the buffer that is predetermined as being between the lower limit and the upper limit; and

a fourth discarding unit discarding, when the number of retained packets in the buffer is less than or equal to the stored optimum value as a result of the outputting of one of the read packets, the corresponding packet in the retained packets of the buffer.

9. The packet fluctuation absorbing apparatus according to claim 7, further comprising:  
a packet identifying unit detecting whether each of the received packets is valid or invalid, and adding a valid/invalid indication to a header portion of each of the received packets; and  
a fifth discarding unit discarding, when the number of retained packets in the buffer exceeds the stored upper limit as a result of the inputting of one of the received packets and the corresponding packet is detected as being invalid, the corresponding packet of the received packets in the buffer.

10. The packet fluctuation absorbing apparatus according to claim 7, further comprising:  
a discarding unit discarding, when the number of retained packets in the buffer exceeds the stored upper limit as a result of the inputting of one of the received packets, a corresponding packet in the retained packets of the buffer in accordance with a predetermined discard packet ratio.